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Snow variability and validity of snow stability assessment

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Results of the field studies of spatial snow variability on mountain slopes for such regions as: the Khibini Mountains, the Altai Mountains, the Baikal Range and the Tien Shan Mountains are submitted. Temporal snow variability has been assessed for the Khibini Mountains. Dependences of spatial statistical structure of such characteristics as snow thickness, density and shear strength on wind regime and unevenness of an underlying surface where snow has been deposited on are analyzed. Obtained characteristics of temporal and spatial snow variability were used for snow stability assessment on a few different slopes. The snow stability and possibility of a slab avalanche release were assessed with a block probabilistic model. Results of numerical experiments on snow stability assessment for areas with different spatial structure of the characteristics controlling the stability have been considered. An influence of different parameters of the spatial variability on probability of avalanche release was assessed quantitatively. It has been shown that under some conditions high spatial variability of the snow characteristics can increase an avalanche release probability, but at some ones decrease it. The work has been supported by Russian Foundation for Basic Research (grant 08-05-00883-a).